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Research Progress on Beam Diagnostic Calorimeter Based on Unidirectional Carbon Fiber-Carbon Matrix Composite at ASIPP

Unidirectional carbon fiber-carbon matrix (CFC) composite can be used to diagnose the main features of a particle beam such as its power, divergence and uniformity. Diagnostic calorimeter based on CFC has been developed by the research team of neutral beam injection (NBI) around the world because of its high space resolution. At ASIPP, a negative ion source based neutral beam injector is under construction with H0 beam power of 2 MW at the beam energy of 200-400 keV for the beam duration of 100s. In order to assess the beam characters, a diagnostic calorimeter based on CFC has been developed in the negative ion source test facility. The calorimeter is made of 8 CFC tiles with the size of 200 mm × 400 mm, and it can be moved in/out beam channel by the driving of the step motor. Two IR cameras with 640 × 480 resolution are used to capture the infrared image. This contribution describes test results of CFC and the structure design of diagnostic calorimeter.

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